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Evolutions in knowledge production policy and practice in Japan: A case study of an interdisciplinary research institute for disaster science

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Evolutions in knowledge production policy and practice in Japan: A case study of an interdisciplinary research institute for disaster science

Abstract

This paper examines shifts in the knowledge production policy agenda at Japanese research universities—a transition from discipline-based academic tradition towards interdisciplinary forms of knowledge production—through a case study of a leading interdisciplinary research institute. We examine this transition through the case of Tohoku University, one of seven ‘Designated National Universities’, and its flagship International Research Institute of Disaster Science. Documentary analysis revealed a renewed emphasis on interdisciplinarity, evident in restructuring towards a ‘blended hybrid’ model to reconcile the different institutional logics of diverse research traditions among its staff. Interviews with key stakeholders uncovered the internal dynamics of this process, its barriers and opportunities. We conclude with implications for Japanese higher education, arguing that a shift to ‘blended hybrid’ institutional forms is necessary but insufficient to maintain successful interdisciplinary research institutes. Success is contingent on simultaneous commitment to sustainable international connections and relationships with diverse external stakeholders.

Keywords Global knowledge production; interdisciplinary research; disaster science; Japan

Introduction

Historically successful modes of knowledge production, characterised by academic autonomy and clear distinctions between disciplines, are increasingly supplanted by new modes, emphasising interdisciplinarity and accountability to multiple stakeholders (Nowotny, Scott, & Gibbons, 2003). In addition, the emergence of a ‘global dimension’ in higher education has facilitated the rapid expansion of cross-border research collaboration, evidenced by a rise in both the total number of internationally co-authored publications, and their proportion of all published science (Marginson, 2018). While collaboration is increasing (Chao, 2014), so too is status competition on a global scale, reflected in rankings regarding research, innovation, and international reputation (Marginson & van der Wende, 2007). In this context, leading states in East Asia are pursuing excellence in Science, Technology and Innovation (STI) at universities as a driver of economic development and global status, with a particular focus on high-end technology and the knowledge industries (Mok, 2012).

Japanese higher education led East Asia in the 20th century, but it has since lost its distinguished position. Neighbouring countries have made rapid advances with high levels of public financial support, coinciding with Japan’s economic stagnation and a gradual decrease in the operational budgets of its national universities (Goldfinch, 2006; Shima, 2018). Meanwhile,

Japanese society continues to struggle with advanced social challenges such as an aging population, low birth rate, and frequent natural disasters, issues which are increasingly implicated in the changing STI policy agenda (Ministry of Education, Culture, Sports, Science and Technology [MEXT], 2017). The government has concentrated resources in a few leading research universities to enhance their global position (Kitagawa & Yonezawa, 2017), and promoted the diversification of national universities' income sources and institutional missions to include commercialisation, academic entrepreneurship, and greater collaboration with industry and other knowledge users (Yonezawa & Shimmi, 2015). Furthermore, a recent shift toward interdisciplinary research and collaborative, co-creative approaches to knowledge production is notable. However, the creation of institutional spaces for interdisciplinary research provides challenges for universities globally (Donina et al., 2017; Baptista et al. 2019), and empirical understanding of the institutional processes, organisational forms and conditions that help create successful interdisciplinary spaces is limited.

This paper engages with the 'Designated National Universities' project. From 2017 to 2019, seven national universities were 'Designated' to experiment with new institutional forms for the advancement of the national knowledge economy (Yonezawa, 2019). These institutional forms emphasise an approach that extends beyond traditional academic units, drawing on talent from across the university's disciplinary faculties, and engaging governmental, industrial, and community partners (Tohoku University, 2017). Through a case study of one such institute, the aim of this research was to identify strategies and goals employed, barriers and opportunities for their attainment in practice, and to draw implications for policy and practice in Japanese higher education more broadly.

Evolutions in higher education research policy in Japan

Among leading East Asian economies, top Japanese universities were among the first to become globally competitive (Yonezawa, 2003). The nine Japanese Nobel laureates awarded between 2010-19, are evidence of the significant scientific advances made during the 1970s and 1980s, a period of great success in Japanese universities (Akaike & Hara, 2017). However, following the end of the economic boom of the 1980s, R&D expenditure and productivity plateaued in the first half of the 1990s 'lost decade' (Goto & Motohashi, 2009). The Japanese government subsequently implemented a number of policy reforms designed to renew its research system. The 'Basic Law on Science and Technology' was promulgated in 1995, and research funding was gradually increased through 5-year strategic plans (Goto & Motohashi, 2009). More drastic steps were revealed in 2001, including the incorporation of national and local public universities from 2004, and resource concentration in leading institutions through competitive grants (Yonezawa, 2003). Since, competitive project-based funding has become the norm.

However, despite consistent policy interventions, the slide of Japanese research universities relative to regional competitors continues, and research productivity is declining (Arimoto, 2015). This decline is partially attributed to a relative lack of investment, as public R&D expenditure is lower than other developed countries (Huang, 2018). This lack of investment is justified by the presence of self-contained R&D facilities within private corporations (Newby et al., 2009; NISTEP, 2018), but research suggests that university-industry R&D activities have not become commonplace (Kitagawa, 2017). With little prospect of increased investment that will enable Japan's universities to compete in financial terms, policy initiatives that foster innovation and reform are pertinent. The latest policy reforms represent such a commitment. They seek to strengthening interdisciplinary research (Komiya,

2014; MEXT, 2017) and open Japanese universities to international talent (Armitage, 2019), with the broader national aim of balancing development of the knowledge economy with solving shared social challenges in 'Society 5.0' (Cabinet Office of Japan, n.d.; Fukuyama, 2018).

The 'Designated National Universities' program was is the most prominent of these recent reforms and is designed to support structural reforms in candidate universities. Selected institutions were given a distinct legal status, affording them greater autonomy to manage their resources and commercial activities, and accept investment from venture capital (Kobayashi, 2019). It is this distinct legal status that distinguished the program from previous policy initiatives, by actively encouraging research units to restructure, better supporting interdisciplinary research activities and new forms of external stakeholder engagement. The Designated National Universities program thus represents a new direction for higher education policymaking in Japan and offers new potential to capitalise on interdisciplinary and extra-academic linkages in engaging with shared social challenges.

Conceptualising new forms of knowledge production

The renewed emphasis on interdisciplinarity inherent in the Designated National Universities program reflects new conceptualisations of knowledge production on the global stage. The complexity and interconnectedness of social problems in areas such as public health, nuclear energy and the environment has coincided with demand for innovative solutions that combine knowledge from different scientific disciplines (Hammond, 2019; Rijnsoever & Hessels, 2010). However, existing organisational structures at research universities based on traditional disciplinary research units are not adept at responding to such diverse social challenges. Consequently, the notion of 'Mode 2' knowledge production has emerged as a guiding concept for organisational reform, whereby research is characterised as 'socially distributed, application oriented, trans-disciplinary and subject to multiple accountabilities' (Nowotny et al., 2003, p. 179). Central to this endeavour is the task of building and sustaining 'organised research units' (Geiger, 1990) that go beyond traditional departmental structures and seek to reconcile their competing interests.

In order to better understand organisational forms within such interdisciplinary research units, we draw on the concept of 'institutional logics'. Perkmann et al. (2019) describe how new organisational units at the university must reconcile 'alternative institutional logics', combining elements of both discipline-based and interdisciplinary knowledge production, becoming 'hybrid organisations' in the process. Such organisations may be characterised as 'structural hybrids', wherein different parts of the organisation adhere to different logics, resulting in their compartmentalisation into structurally distinct organisational spaces. Alternatively, in a 'blended hybrid' the whole organisation is characterised by the shared elements of multiple logics (Perkmann et al. 2019). In either case, the creation of interdisciplinary units as 'hybrid spaces' may enable an environment in which academics engage with traditional institutional logic (i.e. disciplinary practices), while they may also engage with 'alternative institutional logics' in collaboration with external stakeholders and create new knowledge by encompassing different disciplinary spaces.

Simultaneously, the development of these new organisational forms has been linked to policy pressures across contexts. First, the emergence of interdisciplinary fields has been conditioned and motivated by pressures on universities to access additional funding sources. Oleksienko and Sá (2010) argue that for such fields to become ‘viable’, university actors need to secure on-going support from sponsors that justify long-term financial commitments and should direct internal resources towards strategic fields that many attract funders. Governments have likewise devised policies to incentivise collaboration between universities and external partners (de la Torre, et al., 2016), forging the development of ‘triple helix’ relationships between university, industry, government (Etzkowitz & Leydesdorff, 2000), and ‘society’ (Leisyte & Fochler, 2018).

To understand the changing institutional processes at leading Japanese universities, in the context of a growing need for transformation across the academic system, we apply these analytical frames in a case study of an emerging interdisciplinary unit at a national research university in Japan.

Tohoku University and the International Research Institute of Disaster Sciences

We analyse the case of Tohoku University and its International Research Institute of Disaster Science (IRIDeS). Tohoku University was established in 1907 as the third ‘Imperial university’ and has a history of world-leading research. Due to cyclical earthquakes affecting the area, in 2007 a university-wide disaster sciences research cluster was formed, drawing on academics from 19 fields across the university. In 2011, the university assumed a new role following the Great East Japan Earthquake and Tsunami, clarifying its vision to contribute to the recovery of both the local area and the nation through its research and knowledge creation (Hirakawa & Imamura, 2013), and IRIDeS was established in 2012 in order to extensively study the recent earthquake/tsunami and its wide-ranging effects. The institute capitalised on the existing research cluster to assemble faculty from various schools, research institutes and centres, and recruited new staff through international public offerings (Hirakawa & Imamura, 2013).

[Table 1 near here]

In 2017, Tohoku University was chosen to join the Designated National University program on the basis of its proposal to further develop its leading interdisciplinary research institutes, including IRIDeS. Specifically, the proposal was based on a fundamental restructuring that prioritised contributions to shared social challenges through interdisciplinarity research undertaken with diverse collaborative partners (IRIDeS, 2018), including experts from the natural and social sciences, industry and international organisations, and the local and international community (see Figure 1). Upon acceptance, Tohoku and IRIDeS were granted greater autonomy to pursue such partnerships and to diversify their research funding sources. As a result, today income based on external funding almost matches the operational budget from the national government (see Table 2.)

[Figure 1 and Table 2 near here]

Research methodology

To better understand the barriers and opportunities to such fundamental reforms within the Designated National Universities program, the authors carried out a qualitative case study of IRIDeS. We chose to employ this single case study because the ‘study-in-depth’ approach allows ‘outsider’ researchers to understand the meaning and significance of a target social phenomena *in situ* (Stark & Torrance 2005, p. 33). While limited claims to generalisability are applicable to all case study research (Bryman 2012), IRIDeS represents a critical case of a core research unit in the Designated National Universities program. Critical case studies are often used when the target population is small, and wherein the choice of case study is guided by the desire to ‘yield the most information and have the greatest impact on the development of knowledge’ (Patton, 2015, p. 276). In this case, only six universities are included in the program, each explicitly identifying only 1-2 research institutes as sites for comprehensive reform. IRIDeS was, therefore, one of a small target population of research institutes. Further, stakeholders within IRIDeS were willing to cooperate with the research, providing access to information and informants with high potential to impact knowledge (Patton, 2015). Thus, while not directly generalisable across the entire Designated National Universities program, we argue that IRIDeS does have a degree of ‘strategic importance in relation to the general problem’ of developing new interdisciplinary research units in Japanese universities (Flyvbjerg, 2006, p. 14), reflective of the recent policy agenda in Japan.

We reviewed internal strategic documents, publications distributed by the institute, and interviewed a maximum variation sample of 15 staff from different fields, genders, nationalities and roles within the institute (Table 3). This purposive sample was chosen to both reveal variation and identify ‘important shared patterns’ in participants’ perspectives (Palinkas et al., 2015). We employed semi-structured interviews to reflect the heterogeneous profiles of interviewees while engaging with a specific research topic (Edwards & Holland, 2013). The interview protocol was informed by the theoretical concepts and research questions that framed our study. Interviews took around one hour, were conducted in English or Japanese according to participants’ preferences, and were audio recorded and professionally transcribed. Thematic coding was employed inductively and in the original language to limit the influence of translation on the analysis (Squires, 2009; Bryman, 2012). The presentation of findings is structured around dominant themes that emerged through an iterative process of analysis and discussion by all members of the research team.

[Table 3 near here]

Findings

Qualitative analysis of documents and interviews with institutional leaders revealed the strategic goals of IRIDeS, and their relationship to the Designated National Universities project. These goals were: (1) restructuring towards a ‘blended hybrid’ organisational model, (2) linking with national and international research and social agendas, (3) attracting international talent, and (4) bringing external stakeholders to the core of IRIDeS’ activities. Interviewees were mostly supportive of these strategies but revealed various barriers to their attainment.

From structural to blended interdisciplinarity

The director of IRIDeS described the disaster sciences as ‘a truly inter- and trans-disciplinary academic field that contributes to the international society by addressing global issues to reduce the damage and loss associated with disasters’ (Elsevier 2017, p. 5), and a commitment to interdisciplinarity was evident. From its inception, the institute drew on expertise from across the entire university. However, until a major reorganisation in 2018, this expertise was subdivided into disciplinary-focused divisions which concentrated researchers from related fields into collaborative teams. In this sense, from 2012-2018 IRIDeS represented a ‘structural hybrid’ space, wherein the umbrella organisation played host to various ‘institutional logics’ from different disciplinary fields, but these remained compartmentalised.

Participants of this study recalled this state of affairs, reflecting on various barriers to mixing these various institutional logics, and the limited interdisciplinary work that was possible as a result. Several confessed to the internal struggle of identification with a particular discipline and the imperatives of interdisciplinarity. Participants still felt obligated to ‘master the current established discipline as their own expertise first’ (Interviewee L), particularly in the absence of an equally established interdisciplinary approach around which they could base their career. Interviewee N had a broad research background including training in civil engineering, economics and urban planning, but reiterated that ‘core research’ in a disciplinary home was critical for researchers. Some participants recognised the value of interdisciplinary collaboration in an abstract sense, but were frank in their preference to work within their own field: ‘isn’t it OK to work hard in the conventional system?’ (Interviewee D).

Participants identified more functional problems with the ‘structural hybrid’ system, citing different research evaluation practices between disciplinary teams. Each team worked with evaluation methods familiar within that field. Interviewee I argued that ‘it’s not just about conducting the research but also about publishing the result’, with optimal publication avenues differing between fields. Participant D was concerned with how collaborative teams would be evaluated, particularly in a system that currently evaluated based on publication numbers or research funding. This resulted in uneven incentives to work across teams, discouraging collaborative research. Participants suggested there was a ‘need to accept diverse valuation practices from all fields’ (Participant B), though little progress had yet been made.

Following its appointment as a Designated National University, renewed commitment to interdisciplinarity within IRIDeS was reflected in an administrative restructuring. The institute dropped its disciplinary-focused divisions in 2018, in favour of research areas defined by shared social challenges that could be worked on by members of any discipline (Figure 1). This administrative reorganisation reflects an attempt to transition from a ‘structural hybrid’ to a ‘blended hybrid’ space, wherein the compartmentalisation of different institutional logics is systematically broken down and the entire organisation becomes characterised by the presence and application of shared logics from multiple disciplinary backgrounds.

While the impacts of this administrative change were yet to fully play out within the institution, some participants indicated that it did appear to have driven some qualitatively different interactions between researchers from different fields. Interviewee H gave the example of interdisciplinary survey teams in which groups of researchers from the institute are tasked with responding to a particular social need or disaster, but with each member maintaining ‘their own approach and their own topic... all shar[ing] the same field and exchanging information to summarize what we’re doing’. By centring around a particular need the team could ‘kill two

birds with one stone’ (Interviewee H), satisfying the disciplinary demands of individual researchers, while also providing an overview of the social challenge in question. Building on this idea, interviewee G argued for more forms of ‘mediated collaboration’, wherein the institute could provide advantageous conditions for interdisciplinary work, such as the interdisciplinary work groups defined by shared social challenges. Interviewee J remarked that ‘in this environment it’s easier to be together with people that are from other disciplines,’ however, interviewees also stressed that patience is needed for meaningful collaborations to arise organically even within a positive collaborative environment. Thus, it appears that the recent transition to a more ‘blended hybrid’ combination of institutional logics within IRIDeS may have potential but requires sustained investment and patience for the full benefits to emerge.

Developing links with national and international agendas

In this transition to a ‘blended hybrid’ space structured around shared social challenges rather than discipline-based units, IRIDeS’ strategy included developing links between national research agendas and those of the international research community. In so doing, the institute seeks to become a world centre of disaster science research through innovation, becoming foundational within the field as it develops globally (IRIDeS, n.d.b). In this vein, the institute’s location near the epicentre of a rarely destructive natural disaster and their direct access to data and affected communities brings with it an opportunity to link its national research agenda with research on the international stage.

The institute’s director argues that IRIDeS has a responsibility to share its internationally valuable data to ‘respond to research needs from all over the world’ (Elsevier, 2017, p. 5), forming one arm of its strategy to link national and international research agendas. However, participants discussed multiple barriers to this approach. Interviewee H criticised the fact that ‘[the data] stays in Japanese’ and is not ‘able to be disseminated internationally’. Thus, an advantage of IRIDeS’ position in the global stage is not being capitalised upon. The same participant explained that incentives to translate data and publish internationally are not high within Japan, because you can ‘research in Japanese, publish in Japanese, present in Japanese for your whole life with no problem.’ Interviewee I suggested that while most academics within IRIDeS do engage in international circles in some capacity, participating more in international conferences and publications was critical for international visibility and integration with international research agendas.

Another strategy involved taking on leadership roles in creating and managing large international projects. For example, IRIDeS co-leads the Disaster Research Group of the Association of Pacific Rim Universities, formed in 2013 to centralise research designed to mitigate the effects of natural disasters in one of the most disaster-prone locations on earth (APRU-IRIDeS, n.d.). In addition, the institute collaborated with the United Nations to establish the Sendai Framework for Disaster Risk Reduction 2015-2030, setting priorities for research, data management and action to prevent and mitigate disasters worldwide (Aitsi-Selmi et al., 2015). While recognising the positive impact of these projects, participants discussed barriers to IRIDeS consolidating its role as a global leader. Interviewee C argued that ‘there are few people who can take on international leadership within IRIDeS,’ with many international leadership responsibilities and opportunities falling on few senior staff.

Attracting international talent

Attracting international researchers has been one strategy to better integrate domestic and international research agendas while building IRIDeS' international profile and competitiveness. However, despite the institute's claims to be an 'international' research institute, interviewees illustrated the ongoing challenge of attracting and retaining international researchers.

A fundamental challenge was attracting high quality staff from abroad. Participants indicated their concern that standard recruitment procedures in Japanese universities do not include explicit descriptions of working conditions and salaries. While these procedures are accepted within Japan, participants worried that such standardised administration procedures might dissuade international talent. Participants also suggested that recruitment practices required greater consideration of equality, diversity and inclusion, citing the visible imbalances in gender and nationality, especially among senior faculty members.

Interviewees also expressed concern that international faculty who were recruited often encountered issues during their time at IRIDeS. Linguistic concerns were a chronic problem. Interviewees reported that almost all administrative discussions and faculty meetings take place in Japanese, and support for the international staff is not systematised. This is partly due to the existence of some Japanese faculty and administrative staff who had difficulty using English in a professional setting. Though most international interviewees could communicate in Japanese, they admitted that there were limited resources in the institute to host international researchers who were not Japanese speakers. Indeed, interviewee H confessed that 'I do not recommend international faculty to work here', citing the need to better adapt to the basic needs of international colleagues.

Beyond linguistic concerns, participants also expressed the difficulties of maintaining interdisciplinary academic collaborations due to clashes between differing academic traditions that were only exacerbated when viewed on a global scale. Interviewee H argued that 'there is a big gap of the style of academic discussion between Japan and the Western world', suggesting that Japanese researchers placed a particular emphasis on the positivist paradigm while relatively neglecting the importance of 'analytical frameworks and the story' that are stressed in the Western tradition. Interviewee J, who trained abroad in the humanities and social sciences, echoed that in Japan 'it's not easy to convince doctors and engineers that you are also a scientist'. Furthermore, interviewee K showed disappointment that 'other Japanese staff and students' at Tohoku University 'did not show interest' in English language or international events organised by the institute, such as the summer school program designed to foster international collaborations.

Participants agreed that these challenges of integrating international staff should be met with institutional reform, but the level of commitment to this reform varied. While a small number of international faculty had gained tenure and the international research collaboration office was newly established in 2019, participants criticised the recent decrease in international faculty within the institute, caused by the end of funding cycles and contracts that were not renewed. Indeed, all 21 full professors at the institute were Japanese (and male), and, among them, only two had been trained at a doctoral level outside of Japan, reflecting a lack of international influence within the leadership group. However, there was no 'specific plan... to invite top international researchers as principal investigators or senior research leaders yet' (Interviewee A), as the institute preferred a 'gradual approach' to international recruitment. Interviewee D also worried that it was 'difficult to accept foreigners' in an insecure funding environment. However, international participants argued for the need to increase the pace of

reform, including developing new educational pathways in-house to provide the stable income necessary to support tenured international faculty.

Interviewee H went on to argue that the few international staff at IRIDeS felt they were solely responsible for establishing networks with the international research community, with low expectations to engage in internationally competitive research. The concentration of responsibility for international activities towards few staff with high proficiency in English was also reported by Japanese participants, for example interviewee N, who welcomed international experts but worried that international faculty who concentrated too much on international endeavours may not understand domestic Japanese issues.

Bringing external stakeholders into core research activities

Finally, to ensure that IRIDeS' work addressed relevant and pressing social needs in both local and international communities, the institute sought to engage with a range of extra-academic partners in government, industry, and local communities. This aspect of the institution's strategy appeared to have had a high degree of success, as interviewees provided evidence of a variety of mutually beneficial relationships between the institute and its partners.

While Tohoku University's 'designated' status ostensibly gives IRIDeS greater autonomy from government, both the national and local governments remain critical partners for the institute. IRIDeS regularly produces reports for the consumption of policymakers (e.g., IRIDeS, 2013), upon whom they also rely for a large portion of their funding. However, some of the difficulties described in retaining international faculty members relate to these funding relationships. As the Ministry of Education, Culture, Sports, Science and Technology has moved increasingly towards project-based funding while decreasing the basic grant for universities (Huang, 2018), so too has the use of temporary contracts for faculty increased. Interviewee G was directly critical of this change, advocating for more consistent funding arrangements to better enable the long-term planning of the institute, particularly in recruitment.

IRIDeS also developed industrial partnerships with multiple private companies, with whom it carried out collaborative research projects and received specific donations. From its formation IRIDeS has been partnered with Tokio Marine, a private insurance broker with over 30,000 employees that was heavily active in the region following the 2011 quake. The disaster illustrated to both partners the limitations of their risk modelling capacity, which they have jointly addressed by bringing together IRIDeS' research expertise and Tokio Marine's enormous manpower to both 'develop better risk evaluation methods' and systems for dissemination advice and information to the general public (IRIDeS, 2016, p. 4-5). Concrete benefits from this program include a widespread education program in high-risk areas, increasing the shared awareness of the lessons learned from the 2011 quake with the potential to save lives in the event of future disasters. Similar programs have been developed with Japan Airlines (JAL), the Japan Broadcasting Corporation (NHK), and Fujitsu. These companies provided technology and resources for the institute, supporting collaborative projects for disaster tourism and volunteer programs (JAL, 2017), archival work (Yamaguchi, 2016), and technical support for a joint project with the United Nations Disaster Statistics Agency (Fujitsu, 2017) to aid the regeneration of the area.

The local community has also become central to IRIDeS' activities, supported by establishment of 'village committees' across the region, through which data can be collected and advice disseminated. Non-academic citizens in the local community have become valued research

partners in some collaborative research projects, to their mutual benefit. This appeared to be an area with potential for growth, as interviewee G explained the benefits of rolling out such community programs prior to the occurrence of natural disasters and the need to expand them to other at-risk locations. Furthermore, they argued that researchers could do more in the form of local engagement, potentially through local media organisations to further facilitate the dissemination of research-based advice.

Conclusions and implications

These findings illustrate the various opportunities and barriers that characterise Japan's emerging policy environment. Analysis of the IRIDeS case revealed an extensive restructuring at the heart of institutional strategies aiming to cultivate interdisciplinary collaborations, international engagement, and proactive relations with a range of external stakeholders. However, a range of practical challenges impeding the attainment of these goals were identified by actors across the institute, indicating the weaknesses in the current model. In the case of IRIDeS, it appeared that top-down restructuring of the institute had brought some positive change but was insufficient. The institutional commitment to create a 'blended hybrid' collaborative unit (Perkmann et al., 2019) was an improvement on the previous 'structural hybrid' model, but still appeared to meet with barriers posed by traditional academic culture and entrenched values and practices between disciplines and the ongoing marginalisation of international actors. Clearly, for the benefits of such 'hybrid' spaces to be felt, they need to be developed alongside broader institutional change, including the integration of international perspectives and actors, and relationships with a broader field of external stakeholders.

Certainly, IRIDeS' success in building industry links and community engagement within Japan are cause to be optimistic about the possibilities for building 'triple helix' collaborative relationships with Japan's civil society and private R&D infrastructure (Newby et al., 2009), contributing to new forms of knowledge production, and without the need for extensive amounts of additional public funding. In this sense, IRIDeS is an example of the ability for isolated research units within Japanese universities to respond to shifting global trends in knowledge production, when given the autonomy and mandate to move away from traditional institutional forms. On the other hand, the persistent challenges preventing the development of such relationships with partners outside Japan are cause for concern. Barriers to internationalisation reported elsewhere in the literature (Brotherhood, Hammond & Kim, 2019; Ota, 2018) were evident here, too, wherein international actors at the institute itself felt excluded from positions of influence in the reformative project, while Japanese actors expressed concern or indifference to personally engaging in international activity. Furthermore, if international linkages and interdisciplinary partnerships are to be developed in earnest, there is an argument to be made for greater stability of funding arrangements, in lieu of short-term project-based schemes. This may encourage institutes like IRIDeS to further integrate international researchers into their long-term project, while also providing the conditions that support the slow process of 'mediated collaboration' and developing a 'shared language' that will be foundational to the eventual development of successful interdisciplinary centres.

In light of these findings, future policy in Japan may seek to learn from the difficulties and capitalise on the successes shown by the IRIDeS case. Despite its difficulties, it appears that the autonomy granted by the Designated National Universities program did provide IRIDeS with an opportunity and mandate to transition to a 'blended hybrid' model and better integrate its interdisciplinary faculty. It also allowed the institute to cultivate greater extra-institutional collaborations, mutually beneficial for its research activities and a host of other local actors.

However, currently such autonomy is concentrated in just the seven universities that received ‘designated’ status, limiting the scope for Japanese higher education to evolve as a system. Potentially, by granting the functional autonomy received by Designated National Universities to other public institutions throughout Japan, there is an opportunity to broaden these benefits. However, these conclusions are based on the study of a single case, and it would be fruitful to assess the emergence of new institutional forms in different contexts throughout Japan and East Asia, and globally, to support the development of new policy.

References

- Aitsi-Selmi, A., Egawa, S., Sasaki, H., Wannous, C., & Murray, V. (2015). The Sendai Framework for Disaster Risk Reduction: Renewing the global commitment to people’s resilience, health, and well-being. *International Journal of Disaster Science*, 6(2)164-176. <https://doi.org/10.1007/s13753-015-0050-9>
- Akaike, S. & Hara, Y. (2017). Nihon no Seisaku teki Bunmyaku kara Miru Nobel Sho (Nobel Prize in the context of science, technology and innovation policy in Japan). *Hitotsubashi Business Review* 65(1), 8-25.
- APRU-IRIDeS. (n.d.). *APRU Multi-Hazards Program: Need for scientific contribution in disaster risk reduction*. Retrieved from <http://aprumh.irides.tohoku.ac.jp/app-def/S-102/apru/wp-content/themes/APRU-IRIDeS/img/page/MHP-pamphlet.pdf>
- Arimoto, A. (2015). Declining symptom of academic productivity in the Japanese research university sector. *Higher Education*, 70(2), 155-172. <https://doi.org/10.1007/s10734-014-9848-4>
- Armitage, C. (2019). Japan expands international scientific links. *Nature Index Japan*. <https://www.nature.com/articles/d41586-019-00829-z>
- Baptista et al. (2019) Interdisciplinary Centers in Latin American Universities: the challenges of institutionalization. *Higher Education Policy*, 32(3), 461-483.
- Brotherhood, T., Hammond, C.D. & Kim, Y. (2019). Towards an actor-centered typology of internationalisation: A study of junior international faculty in Japanese universities. *Higher Education*, 1-16, (Online early access). <https://doi.org/10.1007/s10734-019-00420-5>
- Bryman, A. (2012). *Social Research Methods*. Oxford: Oxford University Press.
- Cabinet Office of Japan (n.d.) *What is Society 5.0?*. Accessed Oct 28, 2019 at https://www8.cao.go.jp/cstp/english/society5_0/index.html
- Chao, R. Y. (2014). Pathways to an East Asian higher education area: A comparative analysis of East Asian and European regionalisation processes. *Higher Education*, 68(4), 559-575. <https://doi.org/10.1007/s10734-014-9728-y>
- de la Torre, E. M., Rossi, F., & Sagarra, M. (2018). Who benefits from HEIs engagement? An analysis of priority stakeholders and activity profiles of HEIs in the United Kingdom. *Studies in Higher Education* (in press), 1– 20.
- Donina et al. (2017). Inconsistencies in the governance of interdisciplinarity: the case of the Italian higher education system. *Science and Public Policy*, 44(6), 865-875.
- Edwards, R., & Holland, J. (2013). *What is qualitative interviewing?*. London: Bloomsbury.
- Elsevier. (2017). *A Global Outlook on Disaster Science*. Retrieved from <https://www.elsevier.com/research-intelligence/resource-library/a-global-outlook-on-disaster-science>
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from national systems and “mode 2” to a triple helix of university–industry–government relations. *Research Policy*, 29(2), 109-123. [https://doi.org/10.1016/S0048-7333\(99\)00055-4](https://doi.org/10.1016/S0048-7333(99)00055-4)

- Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, 12(2), 219-245. DOI: 10.1177/1077800405284363
- Fujitsu. (2017). *UN Development Programme, Tohoku University, and Fujitsu Start Joint Project to Mitigate Major Natural Disaster Damage*. Retrieved from <https://www.fujitsu.com/global/about/resources/news/press-releases/2017/0309-01.html>
- Fukuyama, M. (2018). Society 5.0: Aiming for a New Human-Centered Society. *Japan SPOTLIGHT*, 47-50. https://www.jef.or.jp/journal/pdf/220th_Special_Article_02.pdf
- Geiger, R. L. (1990). Organized research units: Their role in the development of university research. *The Journal of Higher Education*, 61(1), 1-19. DOI: 1.2307/1982031
- Goldfinch, S. (2006). Rituals of reform, policy transfer, and the national university corporation reforms of Japan. *Governance*, 19(4), 585-604. <https://doi.org/10.1111/j.1468-0491.2006.00341.x>
- Goto, A. & Motohashi, K. (2009). Technology policies in Japan: 1990 to the present. In National Research Council (Ed.), *21st Century Innovation Systems for Japan and the United States: Lessons from a Decade of Change: Report of a Symposium* (pp. 29-39). Washington, DC: The National Academies Press. <https://doi.org/10.17226/12194>.
- Hammond, C. D. (2019). Dynamics of higher education research collaboration and regional integration in Northeast Asia: a study of the A3 Foresight Program. *Higher Education*, 1-16, (Online early access). <https://doi.org/10.1007/s10734-019-00363-x>
- Hirakawa, S., & Imamura, F. (2013). *Higashi nihon daishinsai wo bunseki suru* [Analysing Great East Japan Earthquake]. Tokyo: Akashi Shoten.
- Huang, F. (2018). Higher education financing in Japan: Trends and challenges. *International Journal of Educational Development*, 58, 106-115. <https://doi.org/10.1016/j.ijedudev.2016.12.010>
- IRIDeS. (n.d.a). *Preamble*. Retrieved from https://www.preventionweb.net/files/globalplatform/entry_bg_paper~irides.pdf
- IRIDeS. (n.d.b). *About IRIDeS*. Retrieved from <http://irides.tohoku.ac.jp/eng/outline/index.html>
- IRIDeS. (2013). *HFA IRIDeS Review Preliminary Report: Focusing on 2011 Great East Japan Earthquake*. Retrieved from http://irides.tohoku.ac.jp/media/files/archive/HFA_IRIDeS_review_pre.pdf
- IRIDeS. (2016) IRIDeS Report, Vol. 4. Retrieved from http://irides.tohoku.ac.jp/media/files/archive/IRIDeS_Report_04e.pdf
- IRIDeS. (2018). *Annual Report 2017*. http://irides.tohoku.ac.jp/media/files/annualreport/IRIDeS_annual_report_2017.pdf
- JAL. (2017). *Asahi no tsubasa* [Wings of Tomorrow]. Vol. 9. Retrieved from https://www.jal.com/ja/csr/pdf/vol9_12-14.pdf
- Kitagawa, F. (2017). Changing university-industry links in the Japanese national innovation system. In V. V. Krishna (Ed.), *Universities in the National Innovation Systems: Experiences from the Asia-Pacific*, (pp. 35-63). Routledge. DOI: 10.4324/9781315111421-2.
- Kitagawa, F., and Yonezawa, A. (2017). Whither the Japanese system of higher education? Higher education as a public and private good - differentiation and realignment. In D. Palfreyman., T. Tapper., & S. Thomas (Eds.), *Towards the Private Funding of Higher Education: Ideological and Political Struggles*, (Chapter 10). London: Routledge.
- Kobayashi, S. (2019). *Sangaku renkei to benchaa kyapitaru* (Industry-University Cooperation and Venture Capital). *Higher Education Research*, 22, 113-133. Retrieved from <http://www.tamagawa-up.jp/book/b456633.html>
- Komiyama, H. (2014). *Beyond the limits to growth*. Springer Science+ Business Media. <https://doi.org/10.1007/978-4-431-54559-0>

- Leisyte, L., & Fochler, M. (2018). Topical collection of the triple helix: Agents of change in university-industry-government-society relationships. *Triple Helix*, 5(10), 1-4 (Online early access). <https://doi.org/10.1186/s40604-018-0056-6>
- Marginson, S. (2018). Global cooperation and national competition in the world-class university sector. In Y. Wu., Q. Wang, & N. C. Liu (Eds.) *World Class Universities: Towards a global common good and seeking national and institutional contributions*, (pp. 13-53). Brill: Sense. https://doi.org/10.1163/9789004389632_001
- Marginson, S., & van der Wende, M. (2007). To rank or to be ranked: The impact of global rankings in higher education. *Journal of Studies in International Education*, 11(3-4), 306-329. <https://doi.org/10.1177/1028315307303544>
- Ministry of Education, Culture, Sports, Science and Technology. (2017). *White Paper on Science and Technology 2017 (Provisional Translation)*. Tokyo: MEXT. retrieved from <http://www.mext.go.jp/en/publication/whitepaper/title03/detail03/1403453.htm>
- Mok, K. H. (2012). The quest for innovation and entrepreneurship: The changing role of university in East Asia. *Globalisation, Societies and Education*, 10(3), 317-335. <https://doi.org/10.1080/14767724.2012.710120>
- Newby, H., Weko, T., Breneman, D., Johanneson, T., & Maassen, P. (2009). *OECD Reviews of Tertiary Education: Japan*. OECD. Retrieved from <https://www.oecd.org/japan/42280329.pdf>
- National Institute of Science and Technology Policy. (2018). Digest of Japanese science and technology indicators 2018. *NISTEP Research material No. 274*. Tokyo: National Institute of Science and Technology. Retrieved from <http://www.nistep.go.jp/wp/wp-content/uploads/NISTEP-RM274-SummaryE.pdf>
- Nowotny, H., Scott, P., & Gibbons, M. (2003). Introduction: Mode 2 revisited: The new production of knowledge. *Minerva* 51(3). 179-194. <https://doi.org/10.1023/A:1025505528250>
- Oleksiyenko, A., & Sá, C. (2010). Resource asymmetries and cumulative advantages: Canadian and US research universities and the field of global health. *Higher Education*, 59(3), 367-385. <https://doi.org/10.1007/s10734-009-9254-5>
- Ota, H. (2018). Internationalisation of higher education: global trends and Japan's challenges. *Educational Studies in Japan: International Yearbook*, 12(12), 91-105. <https://doi.org/10.7571/esjkyoiku.12.91>
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research. *Administration and policy in mental health*, 42(5), 533-544. doi:10.1007/s10488-013-0528-y
- Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice*. Thousand Oaks, CA: Sage.
- Perkmann, M., McKelvey, M. and Phillips, N. (2019). Protecting scientists from Gordon Gekko: How organisations use hybrid spaces to engage with multiple institutional logics. *Organisation Science*, 30(2), 298-318. <https://doi.org/10.1287/orsc.2018.1228>
- Rijnsoever, F., & Hessels, L. (2010). Factors associated with disciplinary and interdisciplinary research collaboration. *Research Policy*, 40(3) 463-472. <https://doi.org/10.1016/j.respol.2010.11.001>
- Shima, K. (2018). Changes in Governance and Finance at Japanese National Universities After Incorporation. In Shin, J. (Ed.) *Higher Education Governance in East Asia* (pp. 109-123). Springer, Singapore.
- Squires, A. (2009). Methodological challenges in cross-language qualitative research: A research review. *Int J Nurs Stud*, 46(2), 277-287. <https://doi.org/10.1038/jid.2014.371>

- Tohoku University. (2017). Reaching for greater heights. *Nature Focal Point*. Retrieved from https://www.nature.com/documents/FP_Tohoku-U_web.pdf
- Yamaguchi, M. (2016). The future of digital disaster archives to “pass down and utilize”. *NHK Bunken Forum* 2016. Retrieved from https://www.nhk.or.jp/bunken/english/reports/pdf/report_16122601.pdf
- Yonezawa, A. (2003). Making “world-class universities”: Japan’s experiment. *Higher Education Management and Policy*, 15(2). 9-23. <https://doi.org/10.1787/hemp-v15-art10-en>.
- Yonezawa, A. (2019). National university reforms introduced by the Japanese government: University autonomy under fire?. In C. Da Wan., M. N. N. Lee., & H. Y. Loke (Eds.), *The Governance and Management of Universities in Asia: Global Influences and Local Responses*, (pp. 81-93). London: Routledge.
- Yonezawa, A. & Shimmi, Y. (2015). Transformation of university governance through internationalisation: challenges for top universities and government policies in Japan. *Higher Education*, 70(2), 173-186. <https://doi.org/10.1007/s10734-015-9863-0>

Table 1. Staff Profile of International Research Institute of Disaster Science (IRIDeS)

Academic position	Number of staff	International	Female
Professor	21	0	0
Associate Professor	15	2	3
Senior Lecturer	2	0	1
Assistant Professor	17	3	4
Assistant	1	0	0
Total (March 2018)	56	5	8

Source: IRIDeS (2018, p. 21)

Table 2. Financial Summary of IRIDeS (Fiscal Year 2017, Japanese Yen)

Items	Ammount (million yen)
Operational budget from national government	538
Overhead	53
Donation	51
Sponsored research	112
Joint research	34
Sponsored activities (event, social services, etc.)	65
National research grants (Japan Society for the Promoton of Science)	158
Other subsidies	70
Total	1,081

Source: IRIDeS (2018, p. 26)

Figure 1. IRIDeS' 6 missions and collaborative partners



Source: IRIDeS, n.d.a

Table 3. Summary of interview participants

ID	Academic rank	Discipline	Gender	Nationality	International study/work experience
A	Senior	Science and Engineering	Male	Japanese	Y
B	Senior	Science and Engineering	Male	Japanese	Y
C	Senior	Science and Engineering	Male	Japanese	Y
D	Senior	Science and Engineering	Male	Japanese	Y
E	Junior	Science and Engineering	Male	International	
F	Junior	Science and Engineering	Male	Japanese	Y
G	Junior	Science and Engineering	Male	International	
H	Junior	Humanities and Social science	Female	International	
I	Junior	Humanities and Social science	Female	International	
J	Junior	Humanities and Social science	Female	International	
K	Junior	Humanities and Social science	Male	Japanese	N
L	Junior	Humanities and Social science	Male	Japanese	N
M	Junior	Humanities and Social science	Male	Japanese	N
N	Junior	Humanities and Social science	Female	Japanese	Y
O	Junior	Humanities and Social science	Female	Japanese	Y

Source: authors

Note: International study/professional experience is defined as the study led to the doctoral degrees or working experiences abroad as postdoctoral fellows, experts and administrative officers with expertise. We inserted this information only to the Japanese interviewees. All the international interviewees have some form of long term educational experiences (not necessarily at the doctoral level) or professional experiences outside of Japan.